

SONY®

Digital Audio Recorder **PCM-7040**



Interactive
Status
Reporting

ENHANCEMENT OF THE PCM-7040

■ All Functionality Included as Standard

The PCM-7040 recorder supports a wide range of essential features for DAT recording and editing, which were formerly achieved with options on the PCM-7000 Series. These include Time Code Reader/ Generator, Digital I/O, Memory Start, RS-232C I/F, and Edit Memory.

■ Compact, Lightweight and Low Power Consumption

Although these many functions are built into the PCM-7040, its weight of around 10 kg is one-third less than the previous PCM-7030 and its depth is reduced by 115 mm to 360 mm. Power consumption has also been cut from 50 W to 38 W.

■ Start ID Level Sync Function

The Start ID level sync function enables the PCM-7040 to write a Start ID automatically each time the audio level rises from a period of silence and exceeds a designated audio threshold.

■ Internal Clock for Time Date

The new date/time feature allows the automatic time-stamping of recordings. This date and time data can later be read from the tape on any PCM-7040.

■ Eject Control via 37-pin Parallel Remote

The eject function of the cassette transport can be initiated via the 37-pin parallel remote connector.

■ Key Reassignment for Ease of Use

The SPOT ERASE key in the PCM-7050 is now replaced by a new SYNC REC button. The Spot Erase feature is now available through the set-up menu.

■ ISR Support

The PCM-7040 supports the Sony ISR (Interactive Status Reporting) System which allows the user to remotely monitor and report the status of critical performance parameters within the unit (via RS-232C or modem).

PROFESSIONAL FUNCTIONS AND THE CONVENIENCE OF THE DAT FORMAT

■ Memory Start Function

Approximately 3 seconds of audio data from around the play start point is stored in a stereo digital sound memory and this memorized sound is output instantly when the play key is pressed. This eliminates the problem of the output sound being delayed, which is inherent in a rotary head system, and makes the PCM-7040 suitable for on-air applications and sound sweetening in film/video post production. The start point can be trimmed precisely using the memory search/rehearsal functions and the trimmed and designated start point rehearsed any number of times. When operating the time code location and start ID and program number search in the memory start mode, the PCM-7040 automatically stores the audio data around the locate point for instant playback.

■ Time Code Capability

Time code conforming to the SMPTE/ EBU and FILM formats can be recorded in the subcode area. The use of time code enables the rapid location of the required point on the tape. Using the internal time code reader/generator, such advanced operations as electronic editing, chase synchronization and conversion between the SMPTE/EBU/FILM and DAT time code formats become possible.

Absolute time can also be recorded in the subcode area from the beginning of a tape. When recording

consecutive audio segments, continuity of the absolute time across the segments is assured.

■ External Synchronization

The PCM-7040 recorder, with digital I/O and a time code reader/generator provided as standard, can be locked to a variety of external reference signals. These range from SMPTE (drop frame or non-drop frame) and EBU time code to video reference signals in the form of composite video, composite sync or black burst signals. In a configuration without video machines, synchronization can be achieved via the word clock (sampling rate) from a professional digital audio system.

■ Chase Synchronization

Time code chase synchronization is possible in two modes; normal and re-chase. In the normal mode, the recorder returns to normal playback after having locked to the incoming time code. In the re-chase mode, the recorder continues to chase, making it possible to maintain synchronization even when the master recorder is placed in the FF/REW mode or variations have occurred in the master time code. The sync offset time can be adjusted over a range of ± 12 hours to an accuracy of 1/80 frame.

■ General Purpose Interfacing facility

The PCM-7040 offers two types of parallel remote interfaces. The 37-pin connector provides an interface to the RM-D7100 remote controller or to a synchronizer for remote control of transport



REMOTE CONTROL UNIT

■ RM-D7100 Remote Controller

The RM-D7100, a parallel remote control unit, offers convenient transport control over the PCM-7040 when connected via its 37-pin parallel remote connector.

functions. A DIN 8-pin connector accepts fader start/stop signals, providing recorder control from a mixing console.

■ Comprehensive Serial Remote Control

The PCM-7040 is equipped with a 9-pin serial remote connector for convenient control from external equipment. This includes Sony video edit controllers, BVE-2000, BVE-9100 and RM-450, for audio-follow-video editing in sound sweetening applications. For computer-controlled automation applications in multi-recorder configurations, the PCM-7040 featured an RS-232C connector.

■ Subcode Recording

Subcode such as start/skip/end IDs and program numbers can be written, and erased at will, without affecting the recorded time code and audio data. A convenient renumbering function for program numbers is also provided in the PCM-7040.

■ Search/Locate Function

A variety of search/locate functions makes it easy and quick to locate recorded programs.

Time Code Locate:

Any time code address on the tape can be located quickly using the LOCATE key and search dial on the PCM-7040.

Cueing:

Cueing (shuttle function) is performed at $\times 16$, $\times 8$, $\times 3$, $\times 1$, $\times 1/2$ or $\times 1/5$ normal speed by rotating the search dial.

Start ID Search:

At the touch of the NEXT or PREVIOUS key, the tape is rapidly wound or rewound to the next or previous start ID. If a more distant start ID is to be accessed, either key can be pressed the number of times which corresponds to the start IDs that have to be skipped. The tape is automatically located to the exact location or 0.5 seconds before the ID location. This selection is made on the set-up menu.

Program Number and End ID Locate:

The tape is rapidly wound or rewound to the program number or end ID designated by rotating the search dial.

Blank Search:

The blank point where no audio signal is recorded can be automatically searched, and the machine then automatically locates the point which is two seconds prior to the blank point.

■ RAW (Read-After-Write) and RMW (Read-Modify-Write)

Designed with a rotary 4-head system, the PCM-7040 recorder provides two recording modes, RAW (Read-After-Write) and RMW (Read-Modify-Write). In the RAW mode, real-time monitoring of recordings is provided. In the RMW mode, the PCM-7040 allows enhanced punch IN and OUT operation. Digital audio data can be electronically crossfaded at the punch IN and punch OUT points.

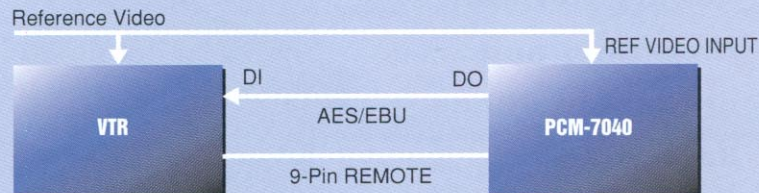
SYSTEM CONFIGURATION

Editing System with Video Editing Controller

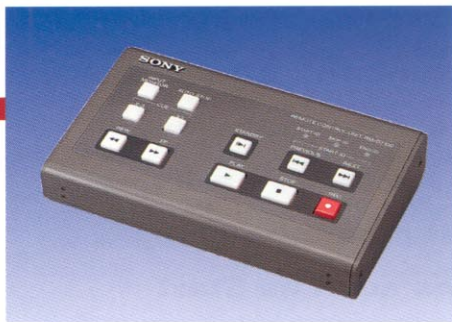
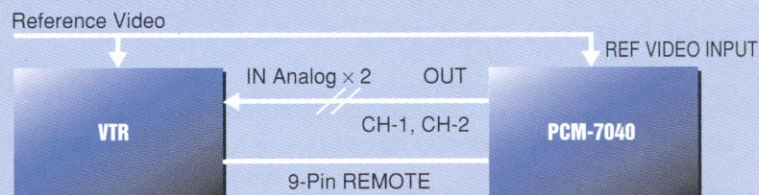


Editing System with VTR

Example 1: Connection to a VTR which has AES/EBU digital audio In/Out



Example 2: Connection to a VTR which has analog In/Out



■ Variable-Speed Playback

The precision-controlled transport of the PCM-7040 allows the playback speed to be varied over the range of $\pm 12.5\%$ in 0.1% steps (internal sync mode) or $\pm 12.4\%$ in 0.2% steps (video sync mode).

■ Input Signal Level Control

Both analog and digital input level can be adjusted. The range is $-\infty$ to $+12.0$ dB in the digital domain.

■ Variable Speed Recording

The PCM-7040 is capable of variable-speed recording over the range of $\pm 0.2\%$ in 0.1% steps, which is effective for the process of posting audio for film and video where 0.1% pull-up and pull-down is often necessary.

■ Informative Display

A distinctive FL display keeps the operator informed of operating status, with stereo peak program meters and full indication of the sampling frequency in use, time code format and address, etc. An error message also appears on this display when the alarm lamp is lit. The display mode can be easily switched with the search dial and dial menu keys to show various data settings.

■ Compact Reliability

With the use of the RMM-31 rack mount adaptor, the PCM-7040 can be mounted in a 19-inch standard rack, taking 3U of space. The rack mount kit requires that the rack is at least 26-inches in depth.

■ 4 Motor Mechanism

The tape is loaded from the front and driven stably by a precision 4-motor direct-drive mechanism under the control of accurate servo electronics.

■ Assured Audio Quality

Designed with the technical expertise of Sony, a world leader in digital audio, and using the most up-to-date devices, the PCM-7040 is a perfect match for the quality requirements of professional applications. Error correction is based on the powerful double-encoded RSC (Read Solomon Code) combined with a sophisticated decoding circuit.

■ Ideal Audio Source for Video Editing Systems

Sony video editors, including the BVE-9100/2000, connected via the 9-pin remote interface give comprehensive control of the transport functions of the PCM-7040 for two-machine editing with a VTR. Under BVE-9100/2000 control, a PCM-7040 performs enhanced audio-follow-video editing with the same editing precision as DAT editing.

Note: The device type of the PCM-7040 is "PCM-7030".

INTRODUCTION

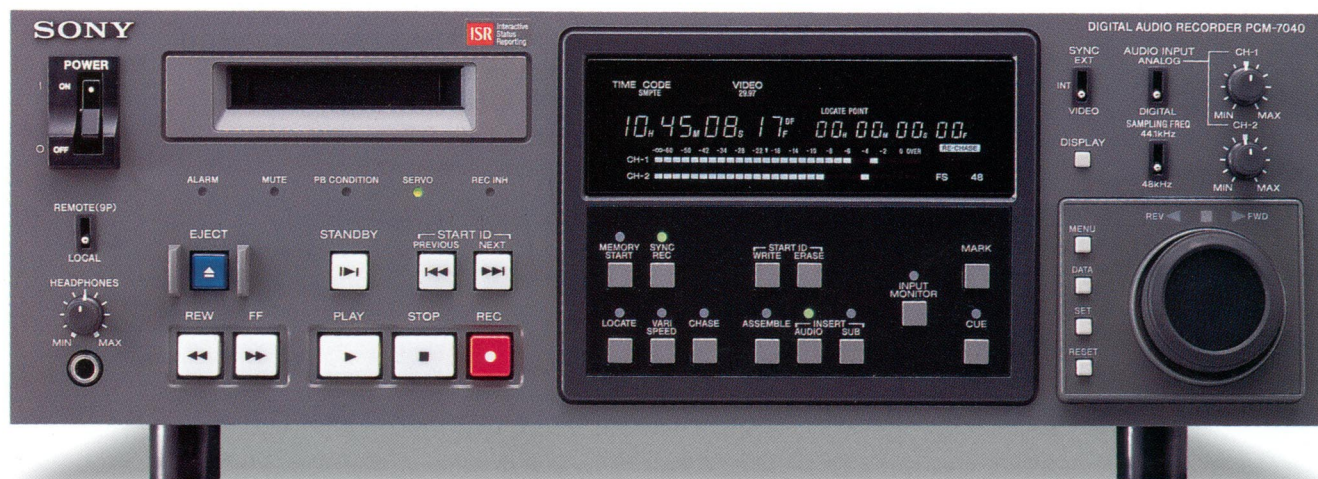
The development of the DAT format has had a profound effect on radio and TV broadcast operations—lightweight recorders have brought digital quality to field recording and studio machines have made possible the introduction of sophisticated editing and post production techniques. Since their introduction in 1991, the Sony PCM-7000 Series of recorders has been a major force in popularizing the use of the DAT format to its current status as a de facto broadcast audio tape standard.

The Sony PCM-7040 is the latest model in the

continuing development of this series. Building on the vast experience gained from the many PCM-7000 Series recorders in daily use around the world, it is smaller, lighter and consumes less power than previous models. Yet it contains, as standard, all the functions that were options on these earlier machines. It also introduces new features such as Start ID Level Sync.



The new PCM-7040 is set to enhance the long-standing reputation earned by Sony PCM-7000 Series recorders for their cost effectiveness and functionality in broadcast studios and in post production houses.



SPECIFICATIONS

Tape Format/Performance

Recording System:	Rotary-head DAT recording
Tape Speed:	8.15 mm/s
Recording Time:	124 minutes (with Sony PDP-124)
Scanner Rotation Speed:	2000 rpm (standard recording/playback)
Track Pitch:	13.6 μ m
Head System:	Helical scanning rotary 4-head system
Variable Speed Range:	$\pm 12.5\%$ (playback)
FF and REW Time:	Max. 60 s (with Sony PDP-124)
Shuttle Speed:	$\times \pm 1/5$, $\times \pm 1/2$, $\times \pm 1$, $\times \pm 3$, $\times \pm 8$ or $\times \pm 16$ normal speed
Jog Speed:	$\times 0$ to $\times \pm 1$, $\times \pm 3$ normal speed

Digital Audio Signal

Number of Channels:	2 channels
Sampling Frequency:	48 kHz, 44.1 kHz
Quantization:	16-bit linear
Error Correction:	Double-encoded RSC (Read Solomon Code)
Modulation:	8 to 10 modulation
Frequency Response:	20 Hz to 20 kHz ± 0.5 dB
S/N Ratio:	More than 90 dB
T.H.D.:	Less than 0.05% at reference level
Wow and Flutter:	Below measurable limit
Cross Talk:	Less than -80 dB (20 Hz to 20 kHz)
Emphasis:	50 μ s/15 μ s, ON/OFF switchable
Phase Difference between channels:	Within 10° (20 kHz)
Delay Time:	Approx. 135 ms (RAW mode)

Inputs/Outputs

Analog Inputs:	+4 dBs (+24 dBs max.), 10 k or 600 Ω , balanced, XLR-3-31 type ($\times 2$)
Analog Outputs:	+4 dBs (+24 dBs max.), less than 50 Ω , balanced, XLR-3-32 type ($\times 2$)
Digital Inputs:	AES/EBU (with transformer), 110 Ω , XLR-3-31 type
Digital Outputs:	AES/EBU (with transformer), 20 Ω , XLR-3-32 type

Time Code Inputs:	IEC461 (SMPTE/EBU), 0.5 to 10 Vp-p (10 k Ω), XLR-3-31 type
Time Code Outputs:	IEC461 (SMPTE/EBU), 2.4 Vp-p, XLR-3-32 type
Word Sync Inputs:	TTL compatible, 75 Ω , unbalanced, BNC type
Word Sync Outputs:	TTL compatible, low impedance, unbalanced, BNC type
Video Sync Inputs:	NTSC/PAL/SECAM or 50 Hz 60 Hz square wave, 0.3 to 4 Vp-p, 75 Ω , unbalanced, BNC type
Parallel Remote:	TTL compatible, D-sub 37-pin TTL compatible, DIN 8-pin
Serial Remote:	RS-422, D-sub 9-pin
Computer I/F:	RS-232C, D-sub 25-pin
Monitor Outputs:	-10 dBs, at less than 150 Ω , RCA pin jack ($\times 2$)
Headphone Outputs:	-26 dBs at reference level (8 Ω load) stereo phone jack

* 0dBs = 0.775V

General

Dimensions:	424 (W) \times 132 (H) \times 360 (D) mm 16 $\frac{3}{4}$ \times 5 $\frac{1}{4}$ \times 14 $\frac{1}{4}$ inches
Mass:	Approx. 10 kg (21 lb 1 oz)
Power Requirements:	AC 120 V $\pm 10\%$, 60 Hz AC 230 V $\pm 6/-10\%$, 50/60 Hz
Power Consumption:	Approx. 38 W at AC 120 V Approx. 0.3 A at AC 230 V

Supplied Accessories

AC Power Cord (1)
Operation Manual (1)

Optional Accessories

RMM-30 Rack Mount Rail
RMM-31 Rack Mount Adaptor
PDP-24/34/64/94/124 Digital Audio Tape
DT-10CLA Cleaning Tape



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